

[54] **FIBER OPTIC HYDROPHONE
TRANSDUCERS**

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[57] **ABSTRACT**

Apparatus is provided including a light source, a transducer and a detector, which is capable of detecting applied acoustic signals. The transducer employs first and second ridged members which have parallel rippled surfaces which contact opposite sides of a fiber optic waveguide. Each rippled surface has a different predetermined ripple pitch which provides for variable sensitivity along one dimension of the transducer. Modulation of the position of the ridged members relative to one another by means of applied acoustic signals causes microbend attenuation of light transmitted through the waveguide. The modulation of the light provides an indication of the presence of the acoustic signals. The variation in dimensional sensitivity provided by the transducer allows for a determination of the direction of arrival of the acoustic signals. Appropriate selection of pitch and pitch ratio of the two rippled surfaces provides any desired spatial sensitivity distribution of the hydrophone. A transducer is also disclosed which further incorporates magnetic elements to provide a mechanical prestress bias to the waveguide, thus providing a frictionless and hysteresis-free device.

12 Claims, 4 Drawing Figures

